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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/706,072	11/12/2003	Nicolas J. Moll	10003976-4	6364

7590 06/17/2005

AGILENT TECHNOLOGIES, INC.  
Intellectual Property Administration  
Legal Department, DL429  
P.O. Box 7599  
Loveland, CO 80537-0599

EXAMINER

FARAHANI, DANA

ART UNIT PAPER NUMBER

2891

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	Application No. 10/706,072	Applicant(s) MOLL ET AL.	
	Examiner Dana Farahani	Art Unit 2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18, 20 and 21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20 and 21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election with traverse of claims 1-18 and 20-21 in the reply filed on 3/29/05 is acknowledged and persuasive. Accordingly the previous restriction requirement is withdrawn.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-21 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,762,480. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of a bipolar transistor structure with a GaAsSb base with the specific thickness, doping of the base layer, and the fractions of the specific element in the base are claimed in said patent, but not the present claims. As such, the present claims are broader than the patent claims.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 1, 10, 12, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Shigematsu et al., hereinafter the '971 reference (US Patent 6,399,971).

The '971 reference discloses in figure 1, a heterojunction bipolar transistor (HBT) comprising:

a collector 14;

an emitter 18; and

a base 16 located between the collector and the emitter, the base including a layer of gallium arsenide antimonide (GaAsSb) (see column 9, line 45-59) less than 49 nanometers (nm) thick (see column 5, line 39). The reference also discloses base doping concentration of  $1 \times 10^{19}$  and the base is carbon doped (see column 5, lines 39-41, and claim 1)

*Claim Rejections - 35 USC § 103*

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-8, 11, and 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '971 reference, as applied to claim 1 above, and further in view of Gill et al., hereinafter Gill (US Patent 5,770,868).

Regarding claims 2-6, 8, 11, and 13-17, the '971 reference discloses the limitations in the claims, as discussed above, except for expressly stating a range of arsenic fraction, in the base, of 50% to about 51%, 65%, 60%, or 54%-56%, or approximately 55%.

Gill teaches in figure 2, and column 3, that a fraction of 50% As in an AlGaAsSb layer would change the bandgap of the layer, and it will match the lattice constant of the layer more closely with an adjacent Indium containing layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the percentage of Arsenic in the base layer of the '971 to about 50%, to match the lattice constant of the base to that of emitter and collector, and to avoid the lattice deformation that would result from lattice mismatch between the base and the collector/emitter layers.

Regarding claims 7 and 18, the '971 reference discloses the limitations in the claims, as discussed above, except for the base layer is less than 20 nm thick. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to make the base layer as

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thin, in accordance with the miniaturization of electronic components that is ongoing, and favorable in the semiconductor chip manufacturing industry.

8. Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the '971, and '971 over Gill, as applied to claims 1 and 7 above, and further in view of Stanchina et al., hereinafter Stanchina (US Patent 5,349,201).

The '971 reference, and the '971 reference in view of Gill, discloses the claimed invention, as discussed above, except for the base layer is doped with Be.

Stanchina discloses at column 3, lines 39-47, an HBT with Be doped GaAsSb base layer provides improved performance over conventional HBTs by increasing the hole mobilities and valence band offset. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use this material in the HBT structure of the primary reference to increase the performance of the structure.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dana Farahani whose telephone number is (571)272-1706. The examiner can normally be reached on M-F 9:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D. Farahani

A handwritten signature in black ink, appearing to read "B. William Baumeister", with a stylized, sweeping flourish at the end.

**B. WILLIAM BAUMEISTER  
SUPERVISORY PATENT EXAMINER**